The heat capacity of the blast, per 100 molecular volumes, is
obtained from data in Table No. 8, Appendix X.

Heat capacity of hot blast t = 900° 660 calories
Cold blast £=70°..... 50
Absorbed by blast in an increase of 830°. 610
"

The total amount of heat absorbed by the air in heating, during each second the stove is on air, will be

(16.78X44.80-:-100) X 610 = 4586 calories per second.

*(The value 44*80 is the number of molecular volumes of 22.32 liters in 1* m^3.)

With a cycle of one hour upon air, the total amount of heat carried away from the stove by the blast will be

4586X3600-16,590,000 calories.

In making the following computations, no allowance has been made to cover the heat lost through the walls of the stove or the necessary volume of gas to be burned to supply this heat. The amount of gas required will depend in part upon the heat loss and the insulation applied to prevent such loss, upon whether the gas and air from its combustion are preheated or not, upon the design of the combustion chamber, etc. The possibilities of hot-blast stove design have not been as well appreciated as they might be. Detail improvements in burners and valves, with their comparatively slight opportunity for improving the results obtained in producing hot blast, have obscured the greater possibilities of increasing the temperature of the blast by rational construction. Multiple-pass stoves have comparatively little excuse for existence. The main advantage of an even number of passes is the location of valves, etc., near the bottom of the stove. Three-pass stoves are not only irrational in design but require that valves be located near the top of the stove, where trouble is not only difficult to detect but hard to remedy.

Assuming that a temperature change of 100° in

the checker brick is permissible, the weight and volume of brick required will be